

Threaded packaging with a "click" function

BACKGROUND OF THE INVENTION

The present invention concerns a packing with screw thread preferably of plastic material, and including a container body with associated lid, the mouth of the container body being constituted by a cylindric extension with circular cross-section, the cylindric extension having an inner side facing the cavity of the container body, and an outer side including an annular section projecting therefrom, including a number of open grooves that are substantially evenly distributed along the outer side circumference, oriented towards the rim of the mouth and having a bottom, where the lid, which is constituted by a flattish, largely circular body with a diameter greater than the diameter of the cylindric extension, with an upper side and an underside, interacts with the cylindric extension for closing the mouth of the packing, as the lid along the periphery includes an annular section oriented towards the underside of the lid, the side of the lid facing the outer side of the cylindric extension having screw threads for reception in the grooves by placing the lid on the mouth and by making a relative, turning movement between the lid and the container body, whereby the underside of the lid is pressed against the rim of the cylindric extension, and where the grooves and the screw threads, respectively, each includes one half of mutually interacting arresting means for arresting the lid in the screwed on position.

Such packings are e.g. known from US 4,257,526 that indicates a closing device for a bottle where the lid is screwed on with a thread with relatively great pitch so that the lid can be removed and mounted by turning the lid about one quarter of a turn relative to the container body. When replacing the lid on the bottle, it is screwed firmly, as tightly as feasible, with the purpose of preventing leakage of the liquid in the bottle between the underside of the lid and the rim of the container. The said closing device also includes a recess in the bottom of grooves in the external rim of the bottleneck, which is intended for receiving projections on thread projections interacting with the groove for screwing on the lid. The lid is thus arrested by the thread projections being brought into engagement with the grooves by a mutually relative turning movement between the lid and the bottle, whereby the said projections slide down into the re-

cesses in the grooves, whereby the lid is secured to some degree in the closed position.

Also, soft drink bottles are known which further include a sealing, consisting of a ring disposed annularly at the neck with barbs that are embedded in an annular recess close to the lower edge of the cover, the ring being spotwise fastened to the underside of the cover in such a way that by turning the cover, the said spotwise connections are broken.

By reclosing the above bottle indicated in US 4,257,526, it will presumably be difficult to ascertain when the lid is closed and secured by the projections on the thread projections having slid down into the recesses of the grooves, as here we are speaking of a continuous transition.

Application of plastic containers in connection with packing food products is also known, where the mouth of the packing is covered with a lid that e.g. may be provided with retaining means ensuring that the lid is secured in position pressed along the rim of the container by a combination of projection and recesses on the container mouth and the lid associated with the container. Traditionally, the packing has been made with a lid including a gripping edge on a tab hinge along the periphery of the lid which is folded in connection with opening the packing after breaking a theft protection in order to access unfolding of the said tab hinge. By reclosing the packing, the lid is replaced by the said edge of the tab hinge being folded down with the tab hinge in the initial position and the lid is secured in pressed condition against the rim of the container mouth by pressing down the lid, so that the gripping edge on the inner side of the tab hinge engages a projection/recess on the outer side of the mouth.

The latter, traditional way of packing foodstuffs can provide great problems for persons having limited muscular function for different reasons, e.g. due to rheumatism. In such cases, folding of the gripping edge holding the lid on the packing will be even very difficult, though impossible operation to perform. The same is the case in connection with reclosing the packing and folding down, and pressing the cover against the rim of the container mouth may an even very difficult work to do. The same will be

the case regarding breaking up the packing safely providing the folding of the gripping edge around the tab hinge.

5 It is thus the purpose of the invention to indicate a packing with screw thread which simultaneously includes a kind of sealing/theft protection, and which on the other hand is even very easy to open and re-close, and which ensure sufficiently secure sealing between the lid and the rim of the container mouth, particularly by reclosing the packing, and which by closing provides the user with assurance and signal about reclosing of the packing having been accomplished.

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This purpose is achieved by a packing of the kind indicated in the introduction, which is characterised in that one half of the arresting means are constituted by a projection provided in at least one of the grooves close to its bottom and oriented transversely of the grooves and standing up from the bottom of the grooves, and that the second half of the arresting means are constituted by the screw threads in the lid having a slit for receiving the projections for detachable arresting of the lid on the mouth in the same moment as the lid assumes the screwed on position on the mouth of the container body with the underside pressed against the rim of the mouth of the container body.

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20 Hereby is achieved a so-called "click" function in connection with screwing on the lid on the mouth of the container body, indicating that the lid is now screwed on to required extent in order that the underside of the lid has been sufficiently pressed to ensure against leakage of the container contents between the rim of the mouth on the packing and the lid. The click function by the packing according to the invention will be more distinct than by reclosing the bottle indicated in US 4,257,526, as the ends of the threads are to be pressed in over the projections at the bottom of the grooves. In a short moment during the closing procedure, a short stop in the relative, turning movement between the lid and the container will hereby occur, by which a greater pressure is accumulated, finally, due to the elasticity in the material will cause the projections to be received in the slits in the screw threads with a little "click" or snap. The click function thus signals that it is purposeless to attempt further screwing of the lid since the operation is well completed. By the mutual arresting of the locking means, the user will feel a slight jerk that may be of great significance for persons with impaired hear-

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ing that maybe are unable to perceive the click but are instead sensing the slight jerk. Of course, the pitch for respective grooves and the projecting parts in lids on the packing interacting therewith are to be adapted to each other, which is possible in connection with designing the mould etc., a technique which is not discussed any further
5 here.

With the purpose of ensuring good sealing between the lid and the cavity of the container body, the side of the lid facing the cavity of the container body may include a membrane centred about the middle of the lid, the membrane constituted by an annular, projecting section which at least includes a sloping side edge oriented towards the
10 mouth of the container body and continuing into a side running in parallel with the internal side of the mouth, the side being pressed against the inner side of the mouth at its rim when mounting the lid in the arrested position, simultaneously with the underside of the lid being pressed against the rim of the mouth of the container body.

15 Hereby is achieved a sealing face between the internal side of the mouth of the container as well as the upper edge of the rim and the said sides of the lid, resulting in an efficient sealing, as sealing is performed on two faces, a narrow rim edge and a wider section across the internal rim of the container mouth. Furthermore, this means that
20 the "closing-pull" between the container and the lid, and hence the force to be applied for bringing the lid into arrested position, does not have to be very great compared with the sealing effect achieved between lid and container according to the invention. In combination with the click-closing function is here provided a screw thread packing which is particularly suited for storing foodstuff, and in addition a reusable packing
25 which is easy to clean and to use by the visually impaired as well as by persons with weakened muscular function.

With the purpose of ensuring a gradual and efficiently functioning sealing during tightening of the lid, the annular projecting section is conical, as the section closest to
30 the upper side of the lid has a diameter at least corresponding to the internal diameter of the cylindric extension of the mouth of the container body, and that the section closest to the underside of the lid has a diameter being less than the internal diameter of the cylindric extension, and that the sloping side edge runs mainly rectilinearly be-

tween the part of the section closest to the underside of the lid and the side running in parallel with the internal side of the mouth of the container body.

5 With the purpose of increasing the extension of the contact surface between the lid and the internal side of the mouth, the annular section constituting the membrane with the sloping side edge can be recessed in relation to the underside of the part of the lid in contact with the container rim in the mounted, arrested condition of the lid, whereby the extent of the side of the annular, projecting section pressed with the inner side of the mouth is increased. Hereby, a further improved sealing between the lid and the
10 container according to the invention can be attained.

With the purpose of ensuring that the vertical edge on the annular edge at the underside of the lid is effectively moved to pressing against the inner side of the container rim, the freely projecting end edge of the annular section may have a bevelling that
15 slopes from the first side towards the second side of the annularly projecting section. The cover will hereby simply be guided down into the correct position during screwing on of it. A further advantage connected with the conical shape of the lid is that the screw packing according to the invention becomes stackable in empty condition where the lid and container bodies are stacked in respective stable stacks as well as where the
20 packing is filled with a product. In particular, the possibility of stacking the filled screw packing will be very advantageous in connection with transport, since the conical shape in the lid stabilises the packing placed upon it, if the diameter of the container body in that connection is expected to have a diameter less than the least diameter of the annularly projecting section on the upper side of the lid.

25 With the purpose of establishing a theft protection in connection with the above packing, on the rim of the annular section of the lid there can be provided a spotwisely fastened, annular ring, to the underside of which with tab hinges are fastened a plurality of downwards projecting and bendable, interspaced tabs along the entire circumference of the ring, the tabs being intended for accommodation in the recess at the outer
30 side of the container body by placing the lid in screwed on position on the mouth of the container body so that the free sides of the tabs are in contact with the side limitation in the recess.

It is hereby achieved that the lid provided with the above theft protection by closing the packing the first time is sealed/theft protected by the tabs being received in the annular recess at the outer side of the container body, and that the annular ring will remain sitting in the said recess by opening the packing by screwing off the lid, as the
5 ring will become released from the annular section of the lid by breaking the spotwise fastenings.

It may be noted that the aforesaid click function between lid and container body is made in different ways.

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DESCRIPTION OF THE DRAWING

The invention is explained more closely in the following with reference to the drawing, where:

- 15 Fig. 1 is a side view of an embodiment of a screw thread packing according to the invention,
Fig. 2 is a lateral sectional view along the line A-A in Fig. 1 of the screw thread packing shown in Fig. 1,
Fig. 3 is a detail of the screw thread packing shown in Fig. 2 at its mouth,
20 Fig. 4 is a top view of the screw thread packing shown in Fig. 1,
Fig. 5 is a detail sectional view of the screw thread packing shown in Fig. 1, showing sealing surfaces between the lid and the rim and inner side of the packing,
Fig. 6 is a perspective view of the packing shown in Fig. 1,
Fig. 7 is a top view of the container body of the screw thread packing shown in Fig.
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Fig. 8 is a perspective view of the container body shown in Fig. 7,
Fig. 9 is a side view of the container body shown in Fig. 7,
Fig. 10 is a side view of a detail of the container body shown in Fig. 9,
Fig. 11 is a side view of the container body shown in Fig. 7, slightly turned,
30 Fig. 12 is a lateral sectional view along the line B-B in Fig. 11 of the container body shown in Fig. 7,
Fig. 13 is a detail sectional view of the container body shown in Fig. 12 at its rim and

mouth,

Fig. 14 is a bottom view of a lid to the screw thread packing shown in Fig. 1,

Fig. 15 is a side view of the lid shown in Fig. 14,

Fig. 16 is a lateral sectional view along the line C-C in Fig. 14,

5 Fig. 17 is a sectional view of a detail of the lid shown in Fig. 16,

Fig. 18 is a sectional view along the line D-D of the lid shown in Fig. 15,

Fig. 19 is an enlarged sectional view of a detail of the lid shown in Fig. 18, and

Fig. 20 is a perspective view of the lid shown in Fig. 14.

10 In Fig. 1 is shown a packing 2 which is relatively made of plastic material. In the shown embodiment, the packing is constituted by a container body 4 with a bottom 5 and with associated lid 6 which is placed on the mouth 8 of the container, cf. Fig. 2.

15 The mouth of the container body 8, cf. Figs 6 and 8, are constituted by a mainly cylindric extension 10 having a circular cross-section. The cylindric 10 extension has an inner side 12 facing the cavity 14 of the container body 4, and an outer side 16 that includes an annular section 18 projecting therefrom, cf. Figs. 5, 8-11 and 13, including a number of open grooves 22 that are evenly distributed substantially along the circumference of the outer side and oriented upwards towards the rim 20 of the mouth, 20 cf. Figs. 9-11. The grooves 22 are open upwards and are delimited by a bottom 23 in the shape of a stop. The grooves are also including a bottom surface 21 at the outer side of the cylindric extension 10.

25 The grooves 22 also includes one half of arresting means 40 for interacting arresting of the lid 6 that includes the other half of the arresting means 42. The arresting means 40 in the grooves is constituted by a projection 40 which projects from the bottom face 21 close to the stop/bottom 23 of the groove 22, the projection 40 constituted by a top oriented transversely of the groove 22 in the shown embodiment. The use thereof will be described later.

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Below the open grooves 22, the section 18 has, as it particularly appears from Fig. 13, an edge forming one side limitation 24 of a recess 26, the other side limitation 28 of which being constituted by a projection 29 at the outer side 30 of the container body 4.

Figs. 4, 14, 15, 16, 18 and 20 show the embodiment of the packing lid 6 which is constituted by a flattish, mainly circular body 32, the diameter of which being greater than the diameter on the cylindric extension 10 on the container body 4. The lid has an upper side 9 and an underside 11 and interacts with the cylindric extension 10 for closing the mouth 8 of the packing, as the lid along the periphery includes an annular section 34 oriented in direction of the underside 11 of the lid, the side 36 of the section 34 facing the centre 48 of the lid having projecting screw threads 38 for reception in the grooves 22. The lid is put on the mouth 8 of the container body by providing the lid 6 on the mouth 8 and by subsequently making a relative turning movement between the lid 6 and the container body 4, whereby the screw threads 38 projecting on the lid are accommodated in the grooves, and by the sloping of the grooves 22, the underside 11 of the lid 6 will be pressed against the rim 20 of the cylindric extension 10 constituting the mouth of the container body.

As it appears from Fig. 19, the screw threads 38 are having some transverse slits 42 at its free ends. The said slits 42 are intended for receiving the projections 40 from the bottom face 21 in the grooves 22 when the lid 6 is screwed on by a mutual relative turning between the container body 4 and the lid 6.

In connection with putting on the lid, a clicking sound will appear, or a slight snapping sound, at the moment the projections 40 in the grooves 22 are sliding down the slits 42 in the screw threads 38. The said click or snap will be a signal to the user of the packing that the lid has now been screwed tight, as the part of the screw threads 38 disposed after the slits 42 (the front part 43) at the reception of the projections 40 by the slits will bear on the bottom 23 of the grooves 22, whereby the lid cannot be screwed more tightly. By this form of the arresting means between lid 6 and container body 4, the said clicking sound or snap will be even very distinct, as only a small extra turning force is to be exerted by performing the relative turning movement between the lid 6 and the container body 4 during closing of the packing in order to get the material, of which the lid and the container body are made, to yield so much that the front part 43 of the screw threads 38 are passing across the projections 40 in the grooves 22. When the front end 43 of the screw threads are pressed up in level at the top of the projections 40, the screw threads will slide very easily across the top of the said projections

40, and the slightly increased action of force will cause a short-termed, strong acceleration which is abruptly finished by the front ends 43 of the screw threads hitting the bottom 23 of the grooves 22, which will imply enhancement of the click-sound arising from the projections 40 being received in the slits 42.

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At the underside 11 of the lid on the side 44 of the lid 6 facing the cavity 14 of the container body 4 is provided a membrane centred about the middle 48 of the lid in the shape of an annular, projecting section 46 which has an edge 54 sloping towards the rim 20 of the mouth 8 of the container body, which, cf. Fig. 19, continues into a substantially vertically oriented section 55 which by mounting the rim 6 is pressed against the inner side 12 of the mouth 8 at its rim 20. Hereby is achieved a very efficient sealing between lid 6 and the container mouth 8.

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The annular, projecting section 46 can be designed so that it is lowered relative to the area where the upper side of the lid continues into the downwards extending, annular section 34 of the lid 4, as it appears from Fig. 19. Hereby is achieved that the width of the section 55, which, when the screw thread packing is closed, is pressed against the inner side 12 of the mouth 8, becomes enlarged, thereby also increasing the tightness of the packing against liquids. The sloping edge 54 contributes to guiding the lid 4, when it is placed on the rim 20 of the container body. The sloping edge 54 furthermore acts a kind of spring that contributes to providing a sufficient pressing force between the section 55 and the inner side 12 of the mouth 8.

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It is to be noted that the annular, projecting section 46 is conical, as the section 46 close to the upper side 9 of the lid has a diameter at least corresponding to the internal diameter of the cylindric extension 10 of the mouth 8 of the container body, and which section 46 close to the underside 11 of the lid has a diameter which is less than the internal diameter of the cylindric extension 10, and that the sloping side edge 54 is extending mainly rectilinearly between the part of the section 46 which is closest to the underside 11 of the lid and the side 55 running in parallel with the internal side 12 of the mouth 8 of the container body 4. The internal diameter of the section is thereby less than the internal diameter of the cylindric extension 10. The greater diameter of the annular, projecting section 46 in relation to the container mouth, combined with

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the sloping edge 54 and the edge 55, entails that by screwing the lid during opening of the lid and the container body performs a relative displacement against each other and entails an efficient pressing of the side 55 running in parallel with the internal side 12 of the mouth 8 of the container body 4 against the internal side 12 of the container mouth 8.

The recessing of the section 46 furthermore implies that it will be possible to perform a stable stacking of the screw packing 2 in filled/closed condition as well as in separated condition, if only it is ensured that the external diameter of the bottom 5 of the container body 4 is less than or equal to the least diameter of the annular section.

As it further appears from Figs. 16, 18 and 19, an annular ring 62 is provided secured spotwise on the rim 60 of the annular section 34 of the lid, to the underside 64 of which ring 62 is fastened a plurality of downwards projecting, interspaced tabs 68 along the entire circumference of the ring, the tabs being fastened to the ring 62 by tab hinges 66, the tabs hereby becoming bending, and the tabs are intended for accommodation in the recess 26 on the outer side 30 of the container body, cf. Fig. 5.

The packing will thus be sealed by means of the free sides 70 of the tabs 68 becoming received in the recess 26 at the putting on of the lid 6 on the mouth of the container body, cf. Figs. 2 and 5, and in case of an attempt to screwing off the lid 6, the ring 62 with the tabs 68 will remain in the recess 26 since the free tabs 68 will be pressed on and caught against the edge 24 in the recess 26 in connection with screwing off, and the ring 62 will be released from the rim 60 by the annular section 34 by breaking the spotwise connection between the ring and the said rim 60.

When replacing the lid, it will be a relatively simple process to mouth this on the mouth 8 of the container body, as the lid 6 is just placed across the mouth 8, after which a relative, opposite turning between container body and lid is performed until the projections 40 projecting up from the bottom face 21 of the grooves 22 are received in the transverse grooves 42 in the screw threads 38. The lid is secured by the said projections/recesses in the closed position, meaning that the lid is held with the underside 11, and that effective pressing of the side running in parallel with the inter-

nal side 12 of the mouth 8 of the container body 4 against the internal side 12 of the container mouth 8 is effected.

Reference number list:

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|----|----|---|
| | 2 | screw thread packing |
| | 4 | container body |
| 5 | 5 | bottom of container body (4) |
| | 6 | lid |
| | 8 | mouth of container body |
| | 9 | upper side of lid |
| | 10 | cylindric extension of (8) |
| 10 | 11 | underside of lid |
| | 12 | inner side of (10) |
| | 14 | cavity of (4) |
| | 16 | outer side of (10) |
| | 18 | projecting section of (10) |
| 15 | 20 | rim on mouth (8) |
| | 21 | bottom face in groove (22) |
| | 22 | open, sloping grooves in (10) |
| | 23 | bottom of (22) |
| | 24 | one side limitation of (28) |
| 20 | 26 | bottom of groove (22) |
| | 28 | second side limitation of (28) |
| | 29 | projection on outer side (30) of the container body |
| | 30 | outer side (30) of the container body (30) |
| | 32 | flattish, mainly circular body (part of lid (6)) |
| 25 | 34 | downwards projecting, annular section on (32) |
| | 36 | facing side of (34) |
| | 38 | screw thread (36) |
| | 40 | one half of locking means (40) close to the bottom (23) in the open, sloping grooves (22) in the shape of projections standing up from the bottom (26) of the grooves |
| 30 | 42 | locking means (42) on screw threads (38) in the shape of transverse slits |
| | 43 | front edge of screw threads (38) |
| | 44 | side of lid (6) facing the cavity (14) of the container body (4) |

- 46 annular, projecting section on (44)
- 48 centre of lid
- 54 second side of (46) facing (52)
- 55 vertically oriented section of lid (6)
- 5 60 rim of annular section (34)
- 62 annular ring on (60)
- 64 underside of 62
- 66 tab hinges between underside (62) and (68)
- 68 tabs
- 10 70 free sides of tabs (68)